

TASK 2 DATA EVALUATION RECORD

STUDY TYPE: Product Performance

MRID 491839-02. Hoskins, K.R. Bifenthrin Efficacy Response Report for
Sergeant's® Bifenthrin + Nylar Shampoo for Dogs, EPA Reg. No. 2517-138. June 10, 2013.

OCSPP 810.3300: Treatments to Control Pests of Humans and Pets;

Product Name: Sergeant's Bifenthrin Shampoo for Dogs
EPA Reg. No. or File Symbol: 2517-139
Decision number: 481354
DP number: 414457

Prepared for
Registration Division (7505)
Office of Pesticide Programs
U.S. Environmental Protection Agency
Washington, DC 20460

Prepared by
Summitec Corporation
Task Order No.: 2-160

Primary Reviewer:
Dennis M. Opresko, Ph.D.

Signature: Dennis M. Opresko ^{AE}
Date: 11/12/2013

Secondary Reviewers:
Gene Burgess, Ph.D.

Signature: Gene Burgess ^{AE}
Date: 11/12/2013

Robert H. Ross, M.S. Program Manager

Signature: Robert H. Ross [#]
Date: 11/12/2013

Quality Assurance:
Angela M. Edmonds, B.S.

Signature: Angela M. Edmonds
Date: 11/12/2013

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Summitec Corp. for the U.S. Environmental Protection Agency under Contract No. EP-W-11-014

DATA EVALUATION RECORD

[EPA Primary Reviewer's Name]

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MRID:	491839-02. Hoskins, K.R. Bifenthrin Efficacy Response Report for Sergeant's® Bifenthrin + Nylar Shampoo for Dogs, EPA Reg. No. 2517-138. June 10, 2013.
DP BARCODE:	414457
DECISION NO:	481354
SUBMISSION NO:	938765
SPONSOR:	Sergeant's Pet Care Products, Inc. 10077 S. 134th Street Omaha, NE 68138-3710
TESTING FACILITY:	NA
STUDY DIRECTOR:	NA
SUBMITTER:	K.R Hoskins Sergeant's Pet Care Products, Inc.
STUDY COMPLETED:	10/06/2013
CONFIDENTIALITY CLAIMS:	None
GOOD LABORATORY PRACTICE:	"This document is a summary document and is not subject to and does not meet the requirements of 40 CFR Part 160."
TEST MATERIAL:	PRODUCT NAME: Sergeant's Bifenthrin Shampoo for Dogs EPA REGISTRATION NUMBER OR FILE SYMBOL: 2517-139 ACTIVE INGREDIENT NAME: Bifenthrin CHEMICAL NAME: Not given. A.I. %: 0.05% PC CODE: Not provided.

CAS NO.: Not given
FORMULATION TYPE: Shampoo
PRODUCT APPLICATION RATE(S): One-half ounce of product for every 7 pounds of dog weight
ACTIVE INGREDIENT APPLICATION RATE(S)g/m²:
Not given

**PROPOSED LABEL
MARKETING CLAIMS:**

Kills ticks for up to 1 week. Controls ticks. Active against ticks. Kills black-legged ticks, lone star ticks, brown dog ticks, and deer ticks. Kills brown dog ticks for up to 15 days. Kills ticks that may carry Lyme disease. Repels and prevents blood feeding by mosquitoes for up to 2 weeks...Repels mosquitoes for up to 15 days.

STUDY REVIEW

Purpose:

The purpose of this document is to detail the efficacy data to support revisions of the mosquito and tick claims for the amended Sergeant's Bifenthrin Shampoo for Dogs, EPA Reg. No. 2517-139, and Sergeant's Bifenthrin + Nylar Shampoo for Dogs, EPA Reg. No. 2517-138, labels. As both these products contain the same amount of bifenthrin and are applied at the same use rates, their bifenthrin claims for mosquitoes, adult fleas and ticks are the same. With regard to the bifenthrin derived claims, the existing flea claims are not being revised; only the mosquito and tick claims are being revised on the amended labels. With regard to the efficacy data to support these revised claims, these data were previously submitted to, reviewed and accepted by EPA. There are no new efficacy data with this submission, but this document corrects some errors in the reviews and clarifies some inconsistencies in the reviews pertaining to the labels.

MATERIALS AND METHODS

Not relevant, as this MRID is a response to previous reviews of MRIDS submitted in support of Sergeant's Bifenthrin + Nylar Shampoo for Dogs, EPA Reg. No. 2517-138 and Sergeant's Bifenthrin Shampoo for Dogs, EPA Reg. No. 2517-139.

BACKGROUND:

In the original application for the registration of Sergeant's Bifenthrin Shampoo for Dogs, Sergeant's submitted six efficacy reports which were assigned MRID numbers 48122213 – 18 to support the mosquito, adult flea and tick claims. These same reports along with two previously submitted efficacy reports with pyriproxyfen (PPF) in shampoo were cited as the efficacy data for the registration of Sergeant's Bifenthrin + Nylar Shampoo for Dogs. The "new" reports (MRID numbers 48122213 – 18) were reviewed for the Bifenthrin Shampoo for Dogs registration, and the previously submitted PPF efficacy studies were also reviewed for the Bifenthrin + Nylar Shampoo for Dogs registration. The "new" reports which pertain to the

mosquito, adult flea and tick claims were reviewed by a contract primary reviewer, and these reviews are enclosed in Appendix 1. The secondary review on these reports by Dr. Clayton Myers is enclosed as Appendix 2. The reviews for MRID numbers 48122213 – 18 are the same for both products as would be expected. The reviews for the Bifenthrin + Nylar Shampoo product differ from the bifenthrin shampoo reviews because those for the Nylar containing product also include the reviews for the two previously submitted PPF efficacy studies; these two reviews on PPF studies are not enclosed in Appendix 1.

On the basis of these efficacy reviews, the Sergeant's Bifenthrin Shampoo for Dogs and the Sergeant's Bifenthrin + Nylar Shampoo for Dogs products were registered on January 11, 2013 as EPA Reg. No. 2517 – 139 and 2517 – 138, respectively. The efficacy claims with regard to the bifenthrin component had to be revised as per the registration notices. Concentrating only on the bifenthrin component, the Notice of Registration with the required efficacy label changes for Sergeant's Bifenthrin Shampoo for Dogs is enclosed as Appendix 3. The registration notice for the Sergeant's Bifenthrin + Nylar Shampoo for Dogs also contains these efficacy revisions in addition to some for the PPF IGR claims.

MOSQUITO LABEL CLAIMS

EPA DECISION ON MOSQUITO EFFICACY DATA SUBMITTED

EPA's review of the submitted data (Memo dated April 2, 2012 from C. Myers to BW Alexander) reached the following conclusions:

1. Insufficient data were presented to support a label claim "repels and prevents blood feeding for up to 2 weeks."
2. Data for *Anopheles* was not submitted and must be required conditionally.

SUBMITTER'S RESPONSE

1. Duration of Efficacy

The submitter states that sufficient data exists to support changing the duration of "repels and prevents blood feeding" from 1 week (7 days) to 2 weeks (14 days).

Among the six reports submitted with the initial applications for the registrations of Sergeant's Bifenthrin Shampoo for Dogs and for Sergeant's Bifenthrin + Nylar Shampoo for Dogs, there are two reports - MRID 48122215 and 48122216 containing mosquito efficacy data.

For MRID 481222-15 the submitter states the following:

Although mortality as well as repellency, measured as a decrease in mosquito landings did not reach the 90% efficacy criterion, repellency in terms of a decrease in the number of mosquitoes blood feeding at both measurement intervals was in fact greater than 90%. Specifically, on Days 6-7 the reduction of blood feeding *Culex quinquefasciatus* was 94%, the reduction of blood feeding *Aedes aegypti* was 93% on Day 13. No other intervals were measured for blood feeding.

The results presented MRID 481222-15 are shown in Tables 5 and 6 below (taken from the DER for MRID 481222-15). The data in Table 5 do not support the proposed label change because the tests were only conducted at Day 6 and Day 7. The data presented in Table 6 indicates that the overall mean % efficacy at preventing blood feeding was 93%. However, this mean combines the data for Day 7 with the data for Day 13. The mean for the three data points for Day 13 is 86.7%, not 93% (Reviewer calculated). Therefore, the results cannot be used in support of the change in the label claim.

Table 5.
Efficacy of Biphenthrin Shampoos against Fleas, Ticks and Mosquitoes on Dogs
Culex quinquefasciatus

Days after Treatment		Days 6 * & 7 *						
Group	Dog no	% landings	% effic	% live	%effic	% fed	%effic	
C	380*	4%		100%		45%		
C	462*	7%		92%		90%		
C	416*	0%		93%		65%		
C	421*	4%		100%		85%		
C	382*	3%		100%		100%		
C	381*	4%		100%		45%		
	Mean	4%		97%		72%		
	+/- S.D.	2%		4%		23%		
A	467*	T	0%	100%	96%	1%	27%	63%
A	422*	R	0%	100%	85%	13%	0%	100%
A	225*	E	0%	100%	78%	19%	0%	100%
A	428*	A	0%	100%	96%	1%	0%	100%
A	373*	T	4%	3%	100%	-3%	0%	100%
A	359*		0%	100%	96%	1%	0%	100%
	Mean		1%	84%	92%	5%	4%	94%
	+/- S.D.		1%	40%	8%	8%	11%	15%

SVR 178D * Day 6 # Day 7
A is the treated group, C is the untreated control.

Table 6.
Efficacy of Biphenthrin Shampoos against Fleas, Ticks and Mosquitoes on Dogs
Aedes aegypti

Days after Treatment		0	Day 7 & 13*					
Group	Dog no		% landings	% effic	% live	%effic	% fed	%effic
C	421*		3%		97%		45%	
C	392*		4%		100%		85%	
C	381*		0%		96%		82%	
C	380*		3%		100%		73%	
C	482*		7%		100%		83%	
C	416*		3%		100%		86%	
	Mean		4%		98%		71%	
	+/- SD		2%		2%		22%	
A	428*	T	0%	100%	85%	13%	0%	100%
A	373*	R	0%	100%	96%	1%	0%	100%
A	359*	E	0%	100%	92%	6%	0%	100%
A	467*	R	3%	6%	100%	-2%	20%	60%
A	422*	T	3%	5%	100%	-2%	0%	100%
A	225*		7%	-89%	100%	-2%	0%	100%
	Mean		2%	37%	96%	2%	5%	93%
	+/- s.d.		3%	77%	6%	6%	12%	16%

SVR 178D

* Day 7 # Day 13

A is the treated group, C is the untreated control.

For MRID 481222-16 the submitter states the following

In this study mosquito mortality, and repellency measured both as (percent landings), and (percent blood feeding) of mosquitoes exposed to treated vs. untreated dogs were assessed. Again, mortality as well as repellency, measured as a decrease in mosquito landings were inadequate. However, repellency in terms of a decrease in the number of mosquitoes blood feeding was again in excess of 90%. Specifically, on Day 19 the reduction of blood feeding *Cx. quinquefasciatus* was 94%, and 96% for *Ae. aegypti* at the same time interval. The primary reviewer agreed with the study author's conclusion for a claim against mosquitoes taking a blood meal for up to 19 days after treatment. The secondary reviewer again concluded the test material was not effective at killing mosquitoes or preventing landings, but was effective at preventing blood feeding.

The overall RECOMMENDATIONS from the secondary reviewer (Dr. Clayton Myers) were the following:

"Mosquitoes: Prevents blood feeding. General kill claim is not supported, but repellence is acceptable for one week (since *Culex* data was only evaluated through 6 days). Data for *Anopheles* was not submitted and must be required conditionally."

The results presented in MRID 481222-16 are shown in Tables 7 and 8 below (taken from the DER for MRID 481222-16).

Results for the *Cx. quinquefasciatus* mosquito test are summarized in Table 7. The test material did not effectively induce mosquito mortality during the one-hour exposure. However, it was 94% effective at reducing blood feeding by the mosquitoes on day 19. The test material was not effective at preventing mosquito landings (results not shown in table).

Table 7.
Efficacy of Biphenthrin Shampoos against Fleas, Ticks and Mosquitoes on Dogs
Culex quinquefasciatus

Days after Treatment		Dog no	Day 19			
Group			% live	%effic	% fed	%effic
C	392		100%		20%	
C	224		96%		46%	
C	373		100%		46%	
	Mean		99%		37%	
	+/- SD		3%		15%	
A	420	T	89%	10%	0%	100%
A	429	R	92%	7%	0%	100%
A	356	E	93%	6%	7%	82%
	Mean	A	91%	7%	2%	94%
	+/- s.d.	T	2%	2%	4%	10%

SVR 167D

A is the treated group, C is the untreated control.

Results for the *Ae. aegypti* test are summarized in Table 8. The test material did not effectively induce mosquito mortality during the one-hour exposure. However, it was 96% effective at reducing blood feeding by the mosquitoes on day 19. The test material was not effective at preventing mosquito landings (results not shown in table).

Table 8.
Efficacy of Biphenthrin Shampoos against Fleas, Ticks and Mosquitoes on Dogs
Aedes aegypti

Days after Treatment		Dog no	Day 19			
Group			% live	%effic	% fed	%effic
C		361	100%		35%	
C		449	100%		33%	
C		222	100%		36%	
		Mean	100%		36%	
		+/- SD	0%		3%	
A		458	93%	7%	0%	100%
A		234	100%	0%	0%	100%
A		470	100%	0%	0%	100%
A		424	100%	0%	5%	86%
		Mean	98%	2%	1%	96%
		+/- s.d.	3%	3%	3%	7%

SVR 167D

A is the treated group, C is the untreated control.

2. *Anopheles* Data

With regard to the conditional request for *Anopheles* spp. data, Sergeant's has previously submitted a waiver for such data. A waiver request for the requirement of further testing on *Anopheles* spp. (MRID 48793201) was submitted on April 4, 2012 in response to the Agency's request for additional data for Sergeant's Cyphenothrin+Pyriproxyfen Squeeze-On for Dogs (20%), EPA Reg. No. 2517-129, Cyphenothrin+Pyriproxyfen Squeeze-On for Dogs (30%), EPA Reg. No. 2517-130, and Etofenprox/Nylar Spot-On Flea and Tick for Dogs and Puppies, EPA Reg. No. 2517-133. To date, there has been no response to the waiver request from the Agency.

Reviewer's Conclusions

Data from MRID 481222-16 can be used to support a label claim that the product prevents blood feeding by *Culex quinquefasciatus* and *Aedes aegypti* mosquitoes for up to 19 days. This data can support a general label claim against mosquitoes if the requested waiver for *Anopheles* spp. data is granted by the Agency.

TICK LABEL CLAIMS

EPA DECISION ON TICK EFFICACY DATA SUBMITTED

EPA's review of the submitted data (Memo dated April 2, 2012 from C. Myers to BW Alexander) concluded that the data supported the following:

- Black-legged (Deer) Ticks: Kills claim, and residual efficacy for 5 days.
- Lone Star Ticks: Kills claim, no residual claims supported
- Brown Dog Ticks: Kills claim and residual control for 15 days (2 weeks).
- Ticks except Dermacentor: Kills claims are supported against Black Legged Ticks, Deer Ticks, and Lone Star Ticks, but because efficacy was not supported for American Dog ticks, the general tick claim killing claim must be qualified to exclude them

But did not support the following:

General Tick claims (not supported because no American Dog Tick data were submitted or cited). All killing claims against ticks must either be species specific or qualified to exclude American Dog Ticks, unless additional data is submitted or cited.

SUBMITTER'S RESPONSE

The submitter states that sufficient data exist to support a general tick claim on the label and to remove the "except American dog tick" qualifier on the tick claims.

To support the bifenthrin-derived tick claims, six reports were submitted, EPA MRID 48122213-48122218. The results of each study are summarized in the table in Appendix 4 from MRID 491839-02.

APPENDIX 4 from MRID 491839-02

TABLE 1: SUMMARY OF TICK EFFICACY TESTS (PERCENT CONTROL) FOR BIFENTHRIN SHAMPOO

MRID #	American dog tick (<i>Dermacentor variabilis</i>)	Brown dog tick (<i>Rhipicephalus sanguineus</i>)	Lone star tick (<i>Amblyomma americanum</i>)	Blacklegged tick (<i>Ixodes scapularis</i>)
48122213 Summary report	---	---	---	---
48122214	---	---	---	Hair clippings from Day 2 – 88%, 100%
48122215	---	Existing – 98%, 99%, 100% Day 7 --- (Not tested)	Existing --- (Not tested) Day 7 – 67%, 93%, 94%	Hair clippings: Day 2 – 95%, 100% Day 12 – 93%, 100%
48122216	Existing – 94%, 98% Day 7 – 97%, 93% Day 14 – 79%, 80%	Existing – 87%, 76% Day 7 – 98%, 95% Day 14 – 99%, 93%	---	---
48122217 Dose titration study – 1, 2, 3, and 4 mg/kg; labeled dose rate = 2.5 mg/kg	---	Existing: 1 mg/kg – 98%, 98% 2 mg/kg – 100%, 100% 3 mg/kg – 94%, 100% 4 mg/kg – 100%, 100% Day 7: 1 mg/kg – 82%, 85% 2 mg/kg – 99%, 100% 3 mg/kg – 97%, 100% 4 mg/kg – 96%, 95% Day 14: 1 mg/kg – 91%, 82% 2 mg/kg – 93%, 94% 3 mg/kg – 98%, 94% 4 mg/kg – 91%, 92%	---	---
48122218 Dosed at ½ labeled dose rate; 1.25 mg/kg	Existing – 54%, 67% Day 7 – 23%, 28%	Existing – 82%, 85% Day 7 – 32%, 50%	---	---

Reviewer's Note: In MRID 481222-15, the dogs were infested with lone star ticks on Day 7 and counts were made on Days 8, 9 and 10.

At the end of the EPA secondary reviewer's document (Appendix 2); on pages 3 and 4, are the overall recommendations on tick claims for the labeling. Each of these recommendations is listed below followed by a Sergeant's response.

"Black-legged (Deer) Ticks: Kills claim, and residual efficacy for 5 days."

Response – This is correct based upon the data in MRID 48122214 with hair clippings taken on Day 2 (3 days after treatment) with a 48 hour exposure. However, the data in MRID 48122215 (see above) repeat the results with Day 2 clippings but also evaluated Day 11 clippings (12 days after treatment) with a 48 hour exposure. The efficacy of these clippings were 93% after a 24 hour exposure and 100% after a 48 hour exposure. Therefore, the duration of this claim should be 14 days based upon MRID 48122215 and not just 5 days based upon MRID 48122214.

"Lone Star Ticks: Kills claim, no residual claims supported."

Response – Lone Star Ticks were evaluated in MRID 48122215 (see above) with an infestation on Day 7. After this infestation, the efficacies measured based on 24, 48, and 72 hour exposure intervals was 67%, 93%, and 94% respectively. These results demonstrate a residual control for at least 7 days.

"Brown Dog Ticks: Kills claim and residual control for 15 days (2 weeks)."

Response – Agreed.

"Ticks except *D. variabilis*: Kills claims are supported against Black Legged Ticks, Deer Ticks, and Lone Star Ticks, but because efficacy was not supported for American Dog ticks, the general tick claim killing claim must be qualified to exclude them."

"General Tick claims (not supported because no American Dog Tick data were submitted or cited). All killing claims against ticks must either be species specific or qualified to exclude American Dog Ticks, unless additional data is submitted or cited."

"All claims referring to ticks must be revised to exclude American Dog Ticks, including Kill claims."

Response: MRID 48122215 contains data that demonstrates existing American dog tick (*D. variabilis*) infestations were controlled (efficacy of 94% based on 24 hour tick counts and 98% based on 48 hour counts (see above)). Further, in the same study, the test article was effective in controlling new infestations of *D. variabilis* on Day 7 (efficacy of 97% based on 24 hour tick counts and 93% based on 48 hour counts). Following new infestations on Day 14 with *D. variabilis*, the efficacy was 79% based on 24 hour counts and 80% based on 48 hour counts. So, although the efficacy against *D. variabilis* was less than 90% on Day 14, it was greater than 90% after treatment (existing infestation) and was greater than 90% against new infestations on Day 7.

Study Author's Conclusions

Overall with regard to the tick claims, as shown in the summary table in Appendix 4, the efficacy of the bifenthrin shampoo against ticks is the following:

American dog tick (*Dermacentor variabilis*) : Through Day 7

Lone star tick (*Amblyomma americanum*): Through Day 7

Brown dog tick (*Rhipicephalus sanguineus*): Through Day 14

Blacklegged tick (*Ixodes scapularis*): Through Day 14

These data support a general tick claim with residual activity through 7 days (1 week). For the Brown dog tick and Blacklegged tick, the claim for residual activity through 14 days (2 weeks) is supported.

Reviewer's Conclusions

Information provided in the DERs included in Appendix 1 of MRID 491839-02 support the following:

1. American dog tick – *D. variabilis*, adults. Treatment with 2.5 mg bifenthrin/kg 97% effective on Day 8 and 93% effective on Day 9 after re-infestation on Day 7 (MRID 481222-16).
2. Lone star ticks – *A. americanum*, adults. Treatment with 2.5 mg bifenthrin/kg 94% effective on Day 10 after re-infestation on Day 7 (MRID 481222-15).
3. Brown dog ticks – *R. sanguineus*, adults. Treatment with 2.5 mg bifenthrin/kg 94% effective on Day 16 after re-infestation on Day 14 (MRID 481222-16). Treatment with 2 mg bifenthrin/kg was 93% effective on Day 14 and 94% effective on Day 15 after re-infestation on Day 13 (MRID 481222-17).
4. Black-legged ticks – *I. scapularis* nymphs. Hair clippings from dogs taken 12 days after treatment with 2.5 mg bifenthrin/kg was 93% effective on Day 12 and 100% effective on Day 13 (MRID 481222-15).